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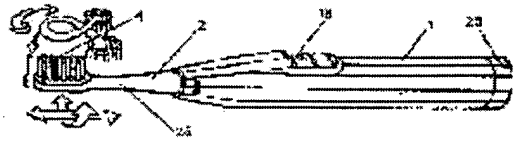
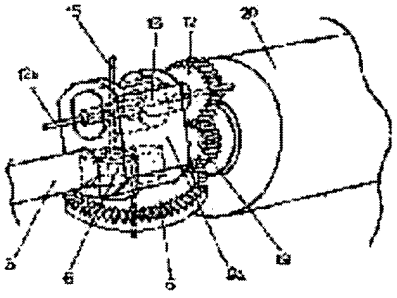
(54) MOTOR-DRIVEN TOOTHBRUSH

(57)Abstract:
PURPOSE: To execute reverse motion and truncated chevron motion, and to refreshingly brush the boundary line of teeth and the grum, between teeth, and the tooth surface by executing simultaneously the oscillating motion in the axial direction and around the axis, and changing its speed.
CONSTITUTION: A turning speed ratio of a face gear 5 and a face gear 12 is set to 1:2, and the face gear 12 is placed side by side with a pinion 19 and supported axially by a supporting shaft together with an eccentric cam 13. By the simultaneous swinging motion by which the swinging motion is executed in the axial direction by the face gear 5, an eccentric cam 6, and a cam follower shaft 9a, and the swinging motion is executed around the axis by the face gear 12, the eccentric cam 13, and the cam follower shaft 9a, a brush part 4 of a toothbrush 2a executes truncated chevron motion through setting the pinion 19, the face gear 5, and the face gear 12 in a proper way. The number of times of swinging in the axial direction and the number of times of swinging around the axis can be changed, the tooth brush part 4 can execute circular motion, reverse motion, and truncated chevron motion at a high speed along a small distance, dental ploque which is scarcely removed is eliminated and teeth are brushed effectively.





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[Date of extinction of right]	24.07.2001

* NOTICES *

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CLAIMS

[Claim(s)]
[Claim 1] The driving shaft which attached in the pedicel (2) the brush section (4) which comes to transplant hair in two or more hair (3), In the motor (20) which drives a driving shaft (3) in the first half, and the electric toothbrush equipped with a driving shaft (3) and casing (1) which comes to hold a motor (20) in the first half A motor (20) and the contrate gear which can be freely rotated by the motor (20) in the first half (5 5a), By the eccentric cam (6) and the eccentric grooved cam (10), enable the splash of a driving shaft (3) to shaft orientations, and a splash is made free at the circumference of a shaft by the contrate gear (7, 12, 12a), and an eccentric cam (8 13) or an eccentric grooved cam (11). Splash motion of the circumference of shaft orientations and a shaft is made to come for a driving shaft (3) to exercise simultaneously. The contrate gear (5 5a) whose splash to shaft orientations is enabled in the first half, the contrate gear whose splash to the circumference of a shaft is enabled with an eccentric cam (6) and an eccentric grooved cam (10) in the first half (7, 12, 12a), The electric toothbrush characterized by the circular motion, reversal motion, and 8 carrying out character motion of the brush section (4) which comes to transplant hair to the pedicel (2) which changed the same rate or the rate and attached rotation of an eccentric cam (8 13) or an eccentric grooved cam (11) in the driving shaft (3) by the method of setting.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application] This invention makes the driving shaft furnished with an electric toothbrush, especially a gear-tooth brush drive simultaneously to the circumference of the shaft orientations and shaft, and relates to the electric toothbrush with which the circular motion, reversal motion, and 8 can carry out character motion of the brush section.
[0002]
[Description of the Prior Art] There are some which some which rotation of a motor is conventionally changed into splash motion, it transmits to a gear-tooth brush, and the electric toothbrush which carries out splash actuation is offered, and move circularly to the thing one direction which makes the circumference of a shake motion **** thing and a shaft rock are in the shaft orientations, and change and use a gear-tooth brush properly in this.
[0003]
[Problem(s) to be Solved by the Invention] There was a problem of being easy to hurt one's gum it being hard to polish between the gear teeth and the gums on which a dental plaque tends to collect although between a tooth flank, a gear tooth, and gear teeth can be polished in the thing which makes a gear-tooth brush rocking to the circumference of a shaft, and there was a problem of being hard to polish between a gear tooth and gear teeth about the thing to shaft orientations made rocking, and about what moves circularly, it was the revolution to an one direction and was not effective. This invention is accomplished in view of the above-mentioned point, and when not hurting one's gum and polishing a tooth flank further, the place made into the object is to offer the electric toothbrush which can be polished with invigoration, while both being able to polish effectively between the boundary line of a gear tooth and the gum and a gear tooth, and gear teeth.
[0004]
[Means for Solving the Problem] In order to attain the above-mentioned object, it sets to the electric toothbrush of this invention. What enables the splash of a driving shaft to shaft orientations in the contrate gear, and the eccentric cam or the eccentric grooved cam by the motor which can be rotated, It comes simultaneously to carry out splash motion of that whose splash is enabled by the contrate gear, and an eccentric cam or an eccentric grooved cam at the circumference of a shaft. The same rate or a rate is changed for rotation of the contrate gear whose splash to shaft orientations is enabled in the first half, the contrate gear whose splash to the circumference of a shaft is enabled to an eccentric cam or an eccentric grooved cam in the first half, and an eccentric cam or an eccentric grooved cam, and the circular motion, reversal motion, and character motion of 8 are carried out by the method of setting.
[0005]
[Function] By making it the driving gear constituted as mentioned above, the count of a splash of shaft orientations and the count of a splash of the circumference of a shaft are changeable, the gear-tooth brush section will remove the dental plaque which the circular motion, reversal motion, and 8 can make carry out character motion at high speed, and cannot take a small distance easily, and their teeth will be

brushed effectively.
[0006]
[Example] Hereafter, if the example of this invention is explained with reference to a drawing, it will set to drawing 1-4. This equips with gear-tooth brush 2a the driving shaft 3 which projected by the cylinder-like casing 1-like edge. Gear-tooth brush 2a brushes teeth carrying out reversal motion, and two or more come to transplant hair in the hair to which the brush section 4 was made as for this from nylon etc. at the end section of the pedicel 2 of the shape of a long picture formed by synthetic-resin material, such as plastics. Fitting of the attachment and detachment of gear-tooth brush 2a is made free at the head of a driving shaft 3. Water proof rubber 17 is arranged in the upper bed section of casing 1 in the first half, a driving shaft 3 is attached in a feed hole, and he is trying not to be invaded into water in casing 1. In casing 1, a motor 20, a cell 21, and the drive section 24 are built in by the chassis 22 in the first half, and the lid 23 is arranged in the 1 round side face of casing for the switch 18 by the soffit. The driving shaft 3 is supported to revolve by the bearing 16 prepared in casing 1, and splash actuation is carried out by the drive section 24 in the first half. The cam floor shaft 9 is formed in a driving shaft 3, with the contrate gear 5, the eccentric cam 6, the contrate gear 7, and the eccentric cam 8, it penetrates with the crank contrate-gear shaft 15, and the drive section 24 is supported to revolve by the chassis 22 in the first half. The pinion 19 attached in output-shaft of motor 20 19a when actuation of the drive section 24 was explained in the first half has geared, the revolution of a motor 20 is transmitted to contrate gears 5 and 7 in the first half, eccentric cams 6 and 8 are attained to further, it is changed into splash motion with the cam floor shaft 9, and splash actuation is carried out by this simultaneous [a driving shaft 3] to the circumference of the shaft orientations and a shaft. The rotation velocity ratio of a contrate gear 5, an eccentric cam 6, and a contrate gear 7 and an eccentric cam 8 is 1:1.5 in the first half. If a contrate gear 5 and a contrate gear 7 are set to a pinion 19 and a revolution of a motor 20 is transmitted by the pinion 19 at the time of the maximum splash of shaft-orientations splash motion and the circumference splash motion of a shaft Since eccentric cams 6 and 8 rotate with contrate gears 5 and 7, it engages with shaft orientations and a shaft with the cam floor shaft 9 which comes to form the long hole of an ellipse configuration in a right angle. The circumference of a shaft will exercise 1.5 ****s to 1 **** of shaft orientations exercising, and the brush section 4 of gear-tooth brush 2a will carry out reversal motion. Refer to drawing 7 and 8.
[0007] In the example shown in drawing 5, it comes to make the rotation velocity ratio of a contrate gear 5 and a contrate gear 12 into 1:2, and a contrate gear 12 is arranged in a pinion 19, and is supported to revolve by support shaft 12b with the eccentric cam 13. 8 will carry out character motion of the brush section 4 of gear-tooth brush 2a by the method of setting of a pinion 19, and a contrate gear 5 and a contrate gear 12 the simultaneous splash motion by which splash motion was carried out at shaft orientations in a contrate gear 5, an eccentric cam 6, and cam floor shaft 9a, and splash motion was carried out at the circumference of a shaft in a contrate gear 12, an eccentric cam 13, and cam floor shaft 9a. Refer to drawing 7 and 8.
[0008] In the example shown in drawing 6, the eccentric grooved cam 10 is formed in HEESUGIA 5a, the eccentric grooved cam 11 is formed in contrate-gear 12a, respectively, and it comes to engage the engagement shafts 14a and 14b with the engagement floor shaft 14, enabling a free splash.
[0009] In drawing 7, it is the contrate gear which carries out splash motion at the circumference of the contrate gear which is what was moved and shown and shaft orientations is made to carry out splash motion, and the eccentric cam and shaft of the brush section 4 of gear-tooth brush 2a of this invention, and a thing showing the rotation velocity ratio of an eccentric cam, and left is shaft orientations and the right is a circumference of a shaft. About notation ****<-->, it is **** at the shaft-orientations maximum splash time, and <--> shows the time of the circumference of shaft maximum splash.
[0010] In drawing 8, if a motion [the above-mentioned rotation velocity ratio] of 1:1.5 is explained further, if the brush section 4 is put into operation at the time of the notation <-** maximum splash, a direction will change at the 2 -> event for 3 minutes, a centrifugal force and an interval will move circularly to <- event at the ** event, the count of a shaft-orientations splash will be set to 1.5 to 1 at the **-> event, and the count of the circumference splash of a shaft will be repeated on this orbit.

[0011] In drawing 9, it is what showed the orbit of the above-mentioned splash reversal motion to the gear tooth, and between a gear tooth, the boundary line of the gum and a gear tooth, and gear teeth will both be polished effectively.
[0012]
[Effect of the Invention] Since this invention is constituted as explained above, it does so effectiveness which is indicated below. Shaft orientations and the circumference splash motion of a shaft are made to exercise simultaneously, and when reversal motion and 8 can carry out character motion by changing a rate, not hurting one's gum while both being able to polish a tooth flank effectively between the boundary line of a gear tooth and the gum, and gear teeth, and polishing a tooth flank further, the effectiveness that it can polish with invigoration is done so.

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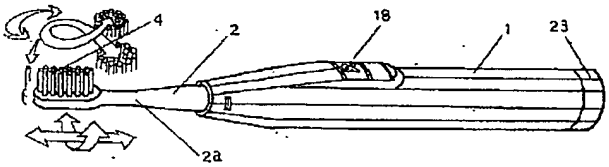
Drawing selection drawing 1



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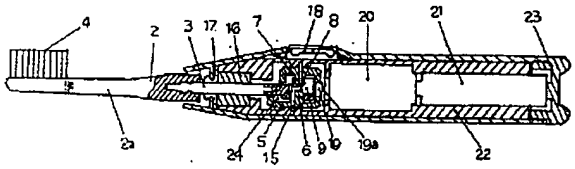
Drawing selection drawing 2



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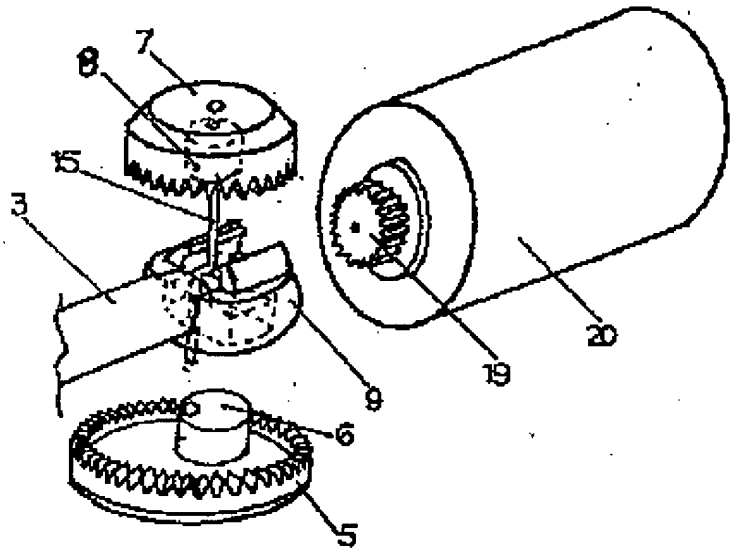
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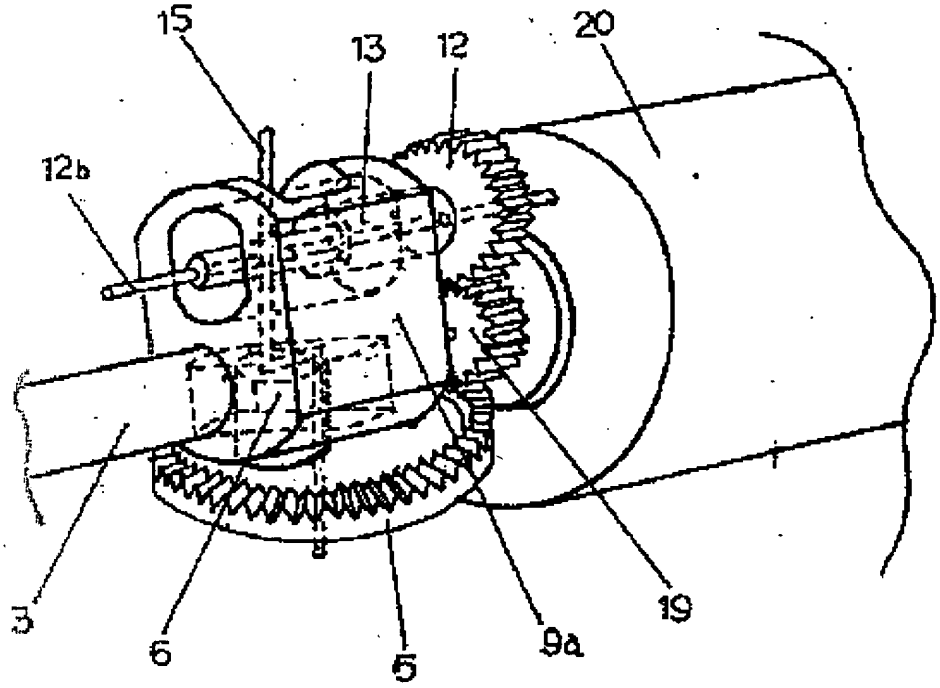
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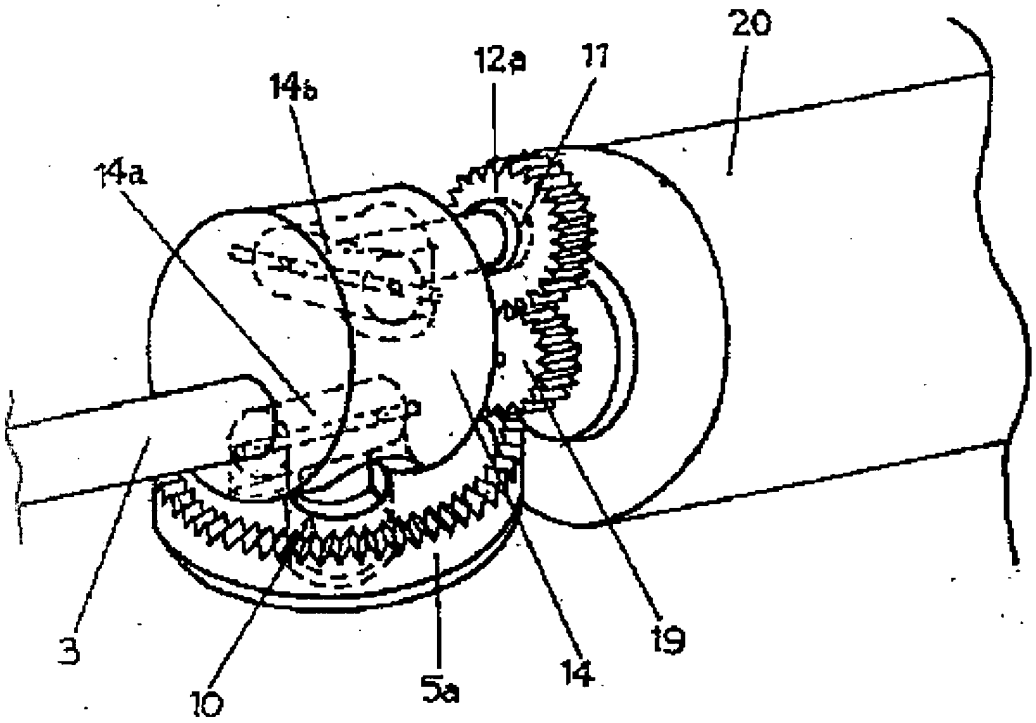
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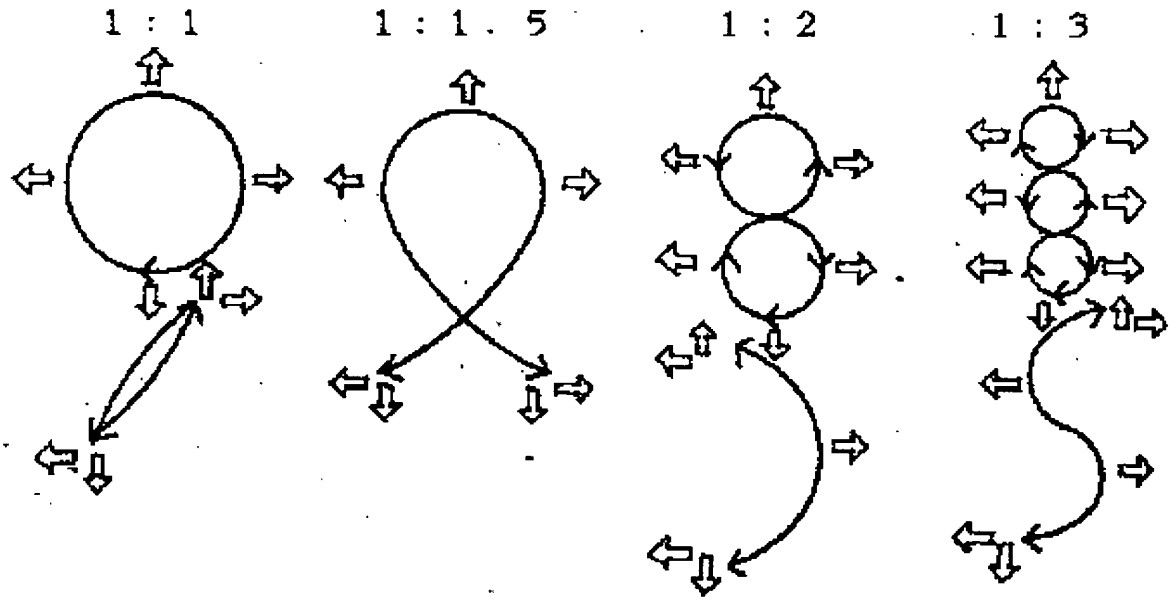
1 : 1
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